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Development of an implementation strategy for physiotherapy guidelines on low back pain

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In the Netherlands, clinical practice physiotherapy guidelines are mainly implemented by using passive implementation strategies. It is well known that these strategies are not effective in establishing changes in behaviour of health care professionals. Therefore, a new implementation strategy was developed for the physiotherapy guidelines on low back pain. This paper describes the method for the design of this strategy. A survey was conducted of 100 physiotherapy practices to identify perceived barriers to implementation of the guidelines and the most important discrepancies between current practice and recommendations of the guidelines. The strategy was further developed using a model for changing professionals' behaviour and systematic reviews on the effectiveness of implementation interventions. The most frequently reported barriers for implementation of the guidelines are related to a lack of knowledge or skills of physiotherapists. The most frequently reported discrepancies between physiotherapy practice and guidelines recommendations were related to the focus of the diagnostic process on impairments, the common use of passive physiotherapeutic interventions, the frequent use of a pain-contingent approach, and the expectations of the patient. The new implementation strategy consisted of multiple interventions, namely education, discussion, role-playing, feedback and reminders. The strategy addressed perceived barriers and discrepancies between current practice and the recommendations of the guidelines. [Bekkering GE, Engers AJ, Wensing M, Hendriks HJM, Van Tulder MW, Oostendorp RAB and Bouter LM (2003): Development of an implementation strategy for physiotherapy guidelines on low back pain. *Australian Journal of Physiotherapy* 49: 208-214]

Key words: Clinical Competence; Guidelines; Low Back Pain; Practice Guidelines

Introduction

The development and implementation of evidence-based guidelines appears to be one of the most promising and effective tools for improving quality of care (Grol 2001). To improve the quality of physiotherapeutic care for patients with low back pain, evidence-based clinical practice physiotherapy guidelines were developed (Bekkering et al 2003; Table 1). The content of these guidelines connects with the evidence-based primary care for low back pain as described in guidelines internationally (Koes et al 2001).

The Dutch physiotherapy guidelines have been implemented by postal dissemination and by drawing attention to them in an article published in a physiotherapy journal. Although the guidelines provide educational tools, active and structured implementation is lacking.

As it is well known that passive implementation strategies are usually not effective (Grimshaw et al 2001), a new and active implementation strategy was developed. The strategy aimed to reduce perceived barriers for implementation that may be related to specific features of the guidelines, features of the target group, features of the social context or

setting, or features of the organisational context (Grol and Jones 2000; Table 2).

The strategy was further constructed using a model for improving professionals' knowledge and influencing the management of primary care clinicians (Grol et al 1994). This model consists of four steps that have to be taken by the clinicians in order to change practice: 1) orientation; 2) insight; 3) acceptance; and 4) change (Table 3). For each step, specific activities or interventions can be chosen to implement guidelines, preferably using evidence-based interventions.

Since to date there are no studies describing implementation interventions of guidelines on physiotherapy, literature about implementation interventions in other health care professions was used. Systematic reviews of the effectiveness of implementation interventions show that information transfer is an essential part of the implementation process, but that multiple interventions are usually needed to achieve changes in practice (Wensing et al 1998); that reminders, multifaceted interventions and interactive educational meetings are consistently effective (Bero et al 1998); and that strategies which are closely linked to the level of clinical decision

Table 1. Six key recommendations in the physiotherapy guidelines on low back pain.**Diagnostic process***1. Assess whether the course of back pain is normal or abnormal**

A long episode of low back pain does not necessarily imply an unfavourable prognosis. However, when an episode of low back pain is associated with long-lasting disability and participation problems, prognosis is poor. Therefore, the guidelines emphasise the course of disabilities and participation problems.

2. Aim the diagnostic process at identifying disabilities and problems with participation (instead of finding a physical cause for the back pain)

In non-specific low back pain it is often not possible to find impairments in anatomical structures causing the complaints. Even possibly identified impairments will usually not provide sufficient explanation for the development or continuation of the complaints. Therefore, the diagnostic interventions should focus on the relevant disabilities and participation problems.

3. Assess the way in which the patient copes with the back pain

Active coping is an important factor for a favourable prognosis. If the patient copes mainly in a passive way, this should be addressed during patient education.

Therapeutic process*4. Give adequate information and advice*

The guidelines recommend that physiotherapists provide information about the nature and the course of the back pain, that pain does not mean harm, the relation between load and load-bearing capacity and the importance of an active lifestyle. The education enables the patient to regain control over the (consequences of) back pain.

5. Use an active treatment

Based on evidence, useful interventions are patient education and exercise therapy. Traction and biofeedback are not useful. It is unclear whether massage, electrotherapy (including TENS, ultrasound or laser) are useful. The guidelines recommend that interventions of unknown effectiveness be used reservedly and only in support of the active approach.

6. Gradually increase activities and participation according to a time-contingent plan

In a time-contingent program, activities or participation are increased step by step, based on time rather than on pain. The purpose is to increase the level of activities and to decrease pain behaviour and to prevent further disablement of patients.

*The guidelines define the course of low back pain as normal if the duration of the back pain is less than three weeks or if activities or participation increase in time, and abnormal if activities or participation do not increase within a time-period of three weeks.

making process are more likely to have good results (Davis et al 1995, Grimshaw et al 1995).

The effectiveness of an implementation strategy probably depends on the health profession involved, the topic of the guidelines and the setting to which they refer (Grol 2001). Therefore, the general knowledge about implementation was applied to the field of physiotherapy, to low back pain, and to the Dutch primary health care system.

This study aimed to investigate the method of developing an implementation strategy based on an analysis of barriers. Therefore, this article describes the survey of perceived barriers for implementation of the physiotherapy guidelines on low back pain and, subsequently, development of a new implementation strategy.

Method

A survey that was an element in development of the Dutch physiotherapy guidelines (Hendriks et al 2000) was carried

out to identify barriers to implementation. A total of 100 physiotherapy practices, randomly selected from the register of the Royal Dutch Society of Physiotherapy, were invited to participate. Each practice received one questionnaire. The physiotherapists in each practice were asked to discuss the guidelines and to complete the questionnaire together. Therefore, the answers on one questionnaire could represent the opinions of more than one physiotherapist. Data were collected concerning the number of physiotherapists represented by the questionnaire, mean age, gender, working experience and work setting.

The questionnaire contained three questions about perceived discrepancies and barriers between the recommendations in the guidelines and the current physiotherapeutic management of patients with low back pain in primary care (Table 4). The physiotherapists were asked to provide any additional comments about the guidelines or suggestions for clarification or improvement. The comments and suggestions were categorised into five

Table 2. Four groups of factors which determine the uptake and use of practice guidelines (Grol and Jones 2000).

Features of: the guidelines	To improve the uptake and use of guidelines: The guidelines should be feasible, scientifically justifiable, specific and yet differentiated, flexible, clear, readable, didactic and attractive.
the target group	The physiotherapists should have sufficient knowledge and skills, have a positive attitude towards guidelines, and be aware of their knowledge, skills and attitudes.
the social context or setting	The routines of the physiotherapists and the expectations of the patients and colleagues should be conform to the recommendations in the guidelines.
the organisational context	The guidelines should not have negative financial consequences, give problems in organising the care or require big structural changes related to staff or equipment.

Table 3. Steps in the model for changing behaviour of a health care professional (Grol et al 1994).

Step	Goals with respect to professional
Orientation	To be informed To arouse interest
Insight	To understand content of guidelines To gain insight into own way of working
Acceptance	To have a positive attitude towards guidelines To be inclined to change
Change	To implement in practice To maintain the change

groups: 1) knowledge and skills of the physiotherapist; 2) attitude of the physiotherapist; 3) features of the social context or setting; 4) features of the organisational context; and 5) other (Table 2). The perceived discrepancies and barriers were used as directives during subsequent teaching sessions and discussions about the guidelines.

Results

Seventy-six physiotherapy practices (76%) returned the questionnaire. In 49 practices, several physiotherapists had completed the questionnaire together. The 76 questionnaires represent 173 physiotherapists, consisting of 91 men and 82 women. Their mean age was 40.2 years (SD 6.6), 80% had more than 10 years of working

Table 4. Questions in the survey used to assess perceived discrepancies and barriers.

1. Are there any discrepancies between the diagnostic recommendations of the guidelines and the current diagnostic process of patients with low back pain in daily practice? (yes/no; explanation)
2. Are there any discrepancies between the therapeutic recommendations of the guidelines and the current therapeutic process of patients with low back pain in daily practice? (yes/no; explanation)
3. Do you perceive any barriers that hamper you in using the guidelines in your daily practice? (yes/no; explanation)

experience and 84% (n = 64) worked in primary care.

Discrepancies between guidelines and current practice

Diagnostic process Fifty-four percent of the practices (n = 41) were of the opinion that there were discrepancies between current practice and the recommendations concerning the diagnostic process of low back pain in the guidelines. These discrepancies were due mainly to lack of knowledge or skills of the physiotherapists (n = 23) and organisational aspects (n = 13; Table 5).

With respect to the knowledge or skills of physiotherapists, the guidelines recommend focusing the diagnostic process of low back pain on disabilities and problems with participation, and advocate the use of the biopsychosocial model. Fourteen of the 23 practices commented that in daily practice, they use the biomechanical model and that they believe that the back symptoms are caused by an impairment in function or anatomical structure. Consequently, their diagnostic process in patients with low back pain is aimed primarily at finding a physical cause for the back pain. Five practices reported that they did not use a questionnaire to assess the functioning of patients with low back pain as advocated in the guidelines, and four other practices reported other reasons for discrepancies, for example lack of knowledge about application of behavioural principles in patients with low back pain.

With respect to the organisational aspects, 11 of the 13 physiotherapy practices stated that they experienced problems in their co-operation with referring physicians (in the Netherlands, these are mainly general practitioners). The guidelines describe a minimum set of essential referral data regarding diagnosis and (earlier) treatment, and suggest that the referring physician should be contacted if referral data are incomplete. In daily practice, the referral data received from physicians are not always complete, and the physiotherapists stated that they were reluctant to contact the referring physicians because they are usually very busy and do not have time to discuss (the referral of)

Table 5. Percentage and number of practices (N = 76) reporting discrepancies between current practice and the recommendations included in the guidelines for diagnosis and treatment.

	Diagnostic process 54% (n = 41)	Treatment process 64% (n = 49)
Discrepancies (% yes)		
Discrepancy categories:		
Lack of knowledge or skills of physiotherapists	56% (n = 23)	67% (n = 33)
Negative attitude of physiotherapists towards guidelines	5% (n = 2)	2% (n = 1)
Negative influence of social aspects (patients, colleagues)	2% (n = 1)	12% (n = 6)
Negative influence of organisational aspects	32% (n = 13)	6% (n = 3)
Negative influence of other aspects	5% (n = 2)	12% (n = 6)

Table 6. The most frequently reported discrepancies between the physiotherapy guidelines for low back pain and current practice.

Discrepancies or barriers	Addressed in training with
1. The current physiotherapeutic diagnostic process is aimed at finding a physical cause (impairments in functions or anatomical structures) for the back pain	Education, discussion, role-play
2. Contact between physiotherapists and referring physicians is considered to be problematic	Discussion
3. Passive interventions (eg mobilisation, massage, electrotherapy) are regularly used	Education, discussion, role-play, feedback
4. Activities and exercises are usually increased or decreased depending on pain intensity (pain-contingent)	Education, discussion, feedback, reminders
5. Patients are focused on pain and expect hands-on treatment.	Education, discussion, feedback, reminders

patients. Two other practices reported that they would need more time to conduct the diagnostic process as recommended in the guidelines.

Treatment process Forty-nine physiotherapy practices (64%) reported discrepancies between the recommendations for treatment of patients with low back pain in the guidelines and current daily practice (Table 5). Thirty-three practices (67%) reported that the discrepancy was related to a lack of knowledge or skills of the physiotherapists. Twenty-one of these 33 practices ascribed the discrepancy to the difference between traditional and evidence-based treatment. In physiotherapy, traditional passive interventions such as mobilisation, massage therapy and physical modalities are regularly used, and activities are increased depending on pain intensity. Evidence-based treatment consists mainly of active interventions such as exercise therapy or information to increase (daily) activities, and activities are increased depending on time. These practices commented that physiotherapists might not be ready to apply evidence-based physiotherapy. Five practices reported lack of knowledge, specifically with respect to behavioural oriented exercise therapy. Seven practices reported that

they had problems with the perceived recommendation not to treat impairments. Since this recommendation was not included in the guidelines, the problem seems to arise from misinterpretation.

Six physiotherapy practices reported discrepancies between the current treatment and the recommendations in the guidelines because they received negative responses from the patients, stating that patients were very focused on pain and expected "real" (hands-on) treatment instead of (hands-off) exercise therapy and education.

Three practices reported problems with organisational aspects, for example a lack of time. One practice mentioned the need for a change in attitude of the physiotherapist and the patient. There were six other comments, mainly made by physiotherapists working in nursing homes or rehabilitation centres who had difficulty in applying the guidelines because of specific patient characteristics or different working methods.

Table 6 summarises the most frequently reported discrepancies. These discrepancies were key issues in the implementation strategy of the guidelines.

Description of the implementation strategy The strategy consisted of two training sessions in small groups (about 10 physiotherapists per group) to facilitate interaction between the teacher and the physiotherapists. The researcher, who is also a physiotherapist and human movement scientist, organised each training session, together with one of two physiotherapists with ample clinical experience in low back pain. One of these physiotherapists is also a psychologist and human movement scientist, the other is also an epidemiologist and an educationally influential physiotherapist. The training was pilot-tested in a separate group of eight physiotherapists.

Content of the implementation strategy *First session* The first training session consisted of education to inform the physiotherapists about the guidelines, to give them insight into the content of the guidelines and to make them understand how recommendations were formulated. This also aimed to change the physiotherapists' attitudes towards guidelines, if necessary. The education focused on six key recommendations of the guidelines (Table 1). There was ample time for discussion. Role-playing was included to give participants insight into their own working methods and to teach them to deal with "difficult" patients.

The trainer started by explaining the three key recommendations pertaining to the diagnostic process and provided some background information. During the interactive presentation, participants had the opportunity to ask questions, which were answered and discussed immediately. A great deal of attention was paid to the lack of evidence for solely assigning the back pain to a physical cause (Discrepancy 1).

The first role-play focused on history taking. An experienced amateur actor played the role of a patient who had suffered from low back pain for eight weeks: he owned a shop, which he worried about; he thought that activities or exercises might harm his back, and therefore he preferred to rest; and relatives had told him that he might have a herniated disc. The physiotherapists were taught how to make disabilities and participation problems key elements of the diagnostic process (Discrepancy 1).

The trainer then explained three key recommendations pertaining to the therapeutic process. Also during this interactive presentation, questions were asked, answered and discussed.

The second role-play also involved the above-mentioned shop owner, but this time he had overdone the exercising after having received the advice that movement would be good for his back. The patient was confused, and doubted whether the physiotherapist was right about the diagnosis and treatment. He requested massage therapy, because of good previous experiences with massage (Discrepancy 5). The physiotherapists were taught how to explain the treatment goals (from pain to time-contingent; Discrepancy 4) and the actual treatment plan (active treatment; Discrepancy 3).

Second session Between the two sessions, a period of four weeks was planned, in which the physiotherapists were encouraged to work according to the guidelines, aiming to enable physiotherapists to implement the guidelines in practice. They were also stimulated to contact the referring physician(s) to discuss the physiotherapy guidelines and their co-operation (Discrepancy 2).

In the second session, the physiotherapists were asked to share their experiences and discuss potential barriers to implementing the guidelines. Furthermore, they were asked to register details of their management of several patients with low back pain during the four-week interval between the first and the second session. They were then given individual feedback on their management of patients with low back pain. The feedback was followed by a group discussion, the aim of which was to share problems with colleagues and to learn from each other's problems in order to facilitate the actual use of the guidelines in practice.

At the end of the second training session, the physiotherapists received two reminders, which were meant to maintain the change. The first was a laminated picture of the muscles of the back, with a summary of the guidelines on the reverse side, to be used in the treatment during patient education. It emphasised the presence of the many muscles in the back and could be used to explain to the patient that staying active is the best treatment for back pain. Additionally, it has been suggested that explaining back pain as a disc problem rather than a muscular problem increases medication consumption in patients with acute low back pain (Sundararajan et al 1998). The second reminder was a leaflet for patients with information on promoting self-care for low back pain. Both reminders were intended to support the patient education given by the physiotherapist and to remind the physiotherapist that they should use the guidelines.

Discussion

Physiotherapy guidelines are considered to be important tools with which to close the gap between theory and practice, and thus to facilitate evidence-based practice. The physiotherapy guidelines on low back pain are based on results from systematic reviews about effective and efficient physiotherapeutic care for patients with low back pain. The reviews have included studies from various countries conducted in various health care settings. Therefore, recommendations of the guidelines are universal and may be useful for physiotherapists worldwide. The applicability of the evidence-based recommendations is, however, not universal and may depend on the health care system. In the Dutch system, patients do not have direct access to physiotherapy, but need a referral from a primary care physician (or a medical specialist). However, the content of the guidelines would not be changed if the physiotherapists were first contact practitioners.

Guidelines do not implement themselves, and as there are discrepancies between current practice in the Netherlands

and the physiotherapy guidelines on low back pain, it can be concluded that successful implementation is necessary to facilitate evidence-based practice. The gap between evidence-based recommendations and actual physiotherapy practice is also present in other countries such as Britain and Ireland (Foster et al 1999) and Canada (Li and Bombardier 2001). Therefore, the need for implementation of evidence-based recommendation in physiotherapy practice seems to be universal too. Some data suggest that New Zealand physiotherapists adhere to their guidelines, although this survey may have been biased as responders comprised only 17% of the physiotherapists registered on the Accident Compensation Corporation physiotherapy treatment provider databank (Reid et al 2002).

Investigating perceived barriers, and linking these to implementation interventions that have been shown to be effective, is a useful way to design appropriate implementation strategies. This study described in detail the development of the implementation strategy and the strategy itself. We suggest that physiotherapists and physiotherapy associations intending to develop strategies for implementation of guidelines use a similar approach.

The most important discrepancy between current practice and the recommendations of the guidelines is related to the knowledge or skills of the physiotherapists. These findings stress the importance of continuing education and postgraduate education for physiotherapists. The guidelines should help physiotherapists to realise which type of education they need in order to keep their knowledge and skills up to date. In our survey, physiotherapists frequently reported a lack of knowledge with respect to the use of behavioural principles in exercise therapy.

Collaboration with referring practitioners and the expectations of patients are important barriers to implementation of the guidelines. Good collaboration is vital to ensure consistency across professions and to provide optimal quality of care. Changing the expectations of patients may take some time, because some patients may have received traditional treatment for several years. It is the responsibility of the physiotherapist, as a professional, to provide good quality treatment, but in order to do so it may be necessary to try to change the expectations of the patient. Because physiotherapists experience difficulties in changing patients' expectations, learning how to deal with expectations that are not consistent with the guidelines was an important part of the implementation strategy.

A new implementation strategy was developed using literature regarding the effectiveness of implementation strategies. As the strategy was developed in December 2000, systematic reviews from 1995 and 1998 were used. However, if more recent systematic reviews had been included, the conclusions would be roughly the same. Passive approaches to implementation are unlikely to produce positive results; there are no interventions that are effective under all circumstances; reminders are a promising intervention; and multifaceted interventions

targeting different barriers to change are more likely to be effective than single interventions (Grimshaw et al 2001).

In the opinion of the authors, essential elements in the development of an implementation strategy for guidelines are: 1) a survey to identify barriers to the implementation of guidelines; 2) a model for changing professionals' behaviour; and 3) a systematic review of the literature to identify effective interventions for implementation.

Understanding the outcome of implementation in terms of changing physiotherapeutic management, health outcomes and costs is important, as this is more likely to encourage a change in physiotherapy practice. Therefore, at present, a randomised trial is being conducted to evaluate the cost-effectiveness of this implementation strategy.

Conclusion

The development of an implementation strategy for physiotherapy guidelines on low back pain was based on a survey among physiotherapists, a model for behavioural change of professionals and reviews of literature. The strategy consisted of two training sessions in small groups and included education, discussion, role-playing, feedback and reminders. It aimed to reduce perceived barriers in the implementation of these guidelines.

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References

- Bekkering GE, Hendriks HJM, Koes BW, Oostendorp RAB, Ostelo RWGJ, Thomassen J and van Tulder MW (2003): Dutch physiotherapy guidelines for low back pain. *Physiotherapy* 89: 82-96.
- Bero LA, Grilli R, Grimshaw J, Harvey E, Oxman AD and Thomson MA (1998): Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ* 317: 465-468.
- Davis DA, Thomson MA, Oxman AD and Haynes RB (1995): Changing physician performance: a systematic review of the effect of continuing education. *JAMA* 274: 700-705.
- Foster NE, Thompson KA, Baxter GD and Allen JM (1999): Management of nonspecific low back pain by physiotherapists in Britain and Ireland. *Spine* 24: 1332-1342.
- Grimshaw J, Freemantle N, Wallace S, Russell I, Hurwitz B, Watt I, Long A and Sheldon T (1995): Developing and implementing clinical practice guidelines. *Quality in Health Care* 4: 55-64.
- Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, Grilli R, Harvey E, Oxman A and O'Brien MA (2001): Changing provider behavior. *Medical Care* 39 (Suppl. 2): 112-145.
- Grol R (2001): Successes and failures in the implementation of evidence-based guidelines for clinical practice. *Medical Care* 39 (Suppl. 2): 1146-1154.

Grol RTPM, Everdingen van JJE and Casparie AP (1994): Invoering van Richtlijnen en Veranderingen. Een Handleiding voor de Medische, Paramedische en Verpleegkundige Praktijk. [Implementing Guidelines and Innovations. Guide for the Medical, Allied Health and Nursing Practice.] Utrecht: De Tijdstroom.

Grol R and Jones R (2000): Twenty years of implementation research. *Family Practice* 17 (Suppl. 1): 32-35.

Hendriks HJM, Bekkering GE, Van Ettehoven H, Brandsma JW, Van der Wees PJ and de Bie RA (2000): Development and implementation of national practice guidelines: a prospect for continuous quality improvement in physiotherapy. *Physiotherapy* 86: 535-547.

Koes BW, van Tulder MW, Ostelo RWJG, Burton AK and Waddell G (2001): Clinical guidelines for the management of low back pain in primary care: an international comparison. *Spine* 26: 2504-2514.

Li L and Bombardier C (2001): Physical therapy management of low back pain: an exploratory survey of therapist approaches. *Physical Therapy* 81: 1018-1028.

Sundararajan V, Konrad TR, Garrett J and Carey T (1998): Patterns and determinants of multiple provider use in patients with acute low back pain. *Journal of General Internal Medicine* 13: 528-533.

Reid D, Larmer P, Robb G, Hing W and McNair P (2002): Use of a vignette to investigate the physiotherapy treatment of an acute episode of low back pain: report of a survey of New Zealand physiotherapists. *New Zealand Journal of Physiotherapy* 30: 26-32.

Wensing M, Van der Weijden T and Grol R (1998): Implementing guidelines and innovations in general practice: which interventions are effective? *British Journal of General Practice* 48: 991-997.